



This document contains Charting the Course of the Comprehensive Conservation and Management Plan for Tampa Bay: Atmospheric Deposition, Wastewater, Toxic Contamination and Public Health

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File 4 of 7

December 1996

ATMOSPHERIC DEPOSITION

Scientists searching for the causes of bay pollution have only recently turned their attention to the skies. What they've found has led to a major revision in the bay's pollution portrait.

Studies by the NEP estimate that about 29 percent of the bay's total nitrogen burden falls directly to the surface of the water from the atmosphere. That figure is probably much higher if pollutants falling in the watershed are considered, since a portion of these will eventually enter the bay in stormwater runoff. About 1,100 tons of nitrogen fall on the open bay each year; another 6,600 tons are estimated to fall in the watershed.¹

Air pollution also transports significant quantities of potentially toxic contaminants to the bay, including heavy metals such as cadmium, copper, lead and zinc, which are primarily industrial in origin, although vehicle emissions are also a source. For example, experts estimate that about 44 percent of the bay's annual cadmium loading of more than 7,000 pounds comes from the air. Airborne emissions of cadmium are associated with oil- and coal-fired utilities and waste incinerators.² Polycyclic aromatic hydrocarbons (PAHs) associated with the combustion of fossil fuels and other organic compounds also enter the bay from the air, although specific sources are unknown.

While experts have estimated the amount of atmospheric deposition, they still can't pinpoint how much of the nitrogen in emissions generated locally end up in Tampa Bay — or what impact distant emissions have on the bay. They do know that stationary sources such as coal-fired power plants and garbage incinerators contribute about 70 percent of the nitrogen oxides (NOx) released locally. Mobile sources such as cars and boats account for the other 30 percent.³ Fertilizer plants, which use ammonia in manufacturing their product, also release nitrogen to the air. Wastewater treatment plants may be another source of gaseous ammonia.

Nitrogen is a common element that appears naturally in the environment. Part of the challenge facing researchers is identifying how much of the bay's nitrogen loadings come from natural sources, such as lightning, trees or natural wetland discharges.

The largest single source of NOx emissions in the region is Tampa Electric Company, whose Big Bend and Gannon plants together emitted about 88,000 tons of NOx in 1994. In fact, these two facilities are the first and third largest NOx emitters in Florida, according to a report from the Florida Department of Environmental Protection (FDEP).⁴ Eight of the 10 boilers at these facilities are older "Group 2" units that have no NOx controls in place.

The Tampa Bay NEP supports proposed rules under the Clean Air Act which would require improvements to the Group 2 boilers at these and other facilities in the region, resulting in substantial reductions in NOx emissions — and other important air quality benefits. EPA's final rule governing Group 2 boilers is expected in December 1996. Ozone is also a pollutant of concern in the Tampa Bay airshed. From 1980 to 1995,

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the Tampa Bay area was designated as a non-attainment zone for ozone because the region periodically exceeded federal health standards for this pollutant. In addition to the health risks, the region's non-attainment status also restricted economic growth. Ensuing controls focused on reducing industrial and vehicular emissions of volatile organic compounds or VOCs, a precursor of ozone. Subsequent improvements led to the area's reclassification in 1996 as attaining National Ambient Air Quality Standards for ozone.

As part of its request for re-designation, local communities and the FDEP developed a maintenance plan to preserve the area's attainment status for a minimum of 10 years. The plan includes regular tracking for total airborne emissions of VOCs and NO_x, which must remain level or decrease in order to prevent additional analysis and regulatory action. Action might include limitations on stationary or mobile sources of NO_x which, unlike VOCs, have not previously been subject to control.

Atmospheric deposition to Tampa Bay is expected to increase as population, power consumption and traffic grows, although increases may be mitigated in part by Clean Air Act provisions, which require utilities and motor vehicles to reduce emissions. Local communities ultimately should be held accountable only for that portion of atmospheric deposition which comes from local sources. Coordination at the regional and national levels will be necessary to assure broad implementation and enforcement of pollution controls. Pollution prevention through energy conservation also must be emphasized.

Research will continue to be a priority in the effort to understand and address atmospheric deposition. This effort received a boost in 1995 when the Tampa Bay NEP was selected to participate in the U.S. Environmental Protection Agency's (EPA) Great Waters Program, which focuses on atmospheric deposition and its effects on water quality. In cooperation with local communities, this program is sponsoring a three-year Tampa Bay Atmospheric Deposition Study to investigate where the atmospheric deposition is coming from and how large a role it plays in stormwater pollution.

As part of this initiative, the Environmental Protection Commission (EPC) of Hillsborough County has established an air sampling station at its Gandy Boulevard monitoring site to collect daily wet deposition samples and weekly dryfall samples with assistance from Pinellas County. The 18-month study, funded by NEP and EPA, began in August 1996. Results of the investigation will help quantify the amount of atmospheric nitrogen entering the bay and provide additional clues to researchers investigating the sources of the pollution.

SUMMARY OF ACTIONS FOR ATMOSPHERIC DEPOSITION

- AD-1 Continue atmospheric deposition studies and develop an action plan to address this important environmental issue.
- AD-2 Promote public and business energy conservation.

References, Atmospheric Deposition:

- 1 Estimates of Total Nitrogen, Total Phosphorus, and Total Suspended Solids Loadings to Tampa Bay, Florida. Technical Appendix: 1992-1994, Total Nitrogen Loadings to Tampa Bay, Florida. TBNEP Technical Publication #19-96. (1996)
- 2 Chemical Contaminants in the Tampa Bay Estuary: A Summary of Distributions and Inputs. TBNEP Technical Publication #01-95. (1995)
- 3 Florida Department of Environmental Protection. 1994. Air Quality Report, 1994.
- 4 Ibid.

CHARTING
the **COURSE**

FOR TAMPA BAY**AD**

Continue Atmospheric Deposition Studies and Develop An Action Plan to Address this Important Environmental Issue

ACTION:

Continue to investigate the sources and effects of atmospheric deposition, and develop an action plan to address the issue.

BACKGROUND:

The Tampa Bay National Estuary Program estimates that about 29 percent of the bay's total nitrogen loadings are directly deposited to the bay from the air. Atmospheric deposition also contributes significant quantities of toxic substances to the bay, including heavy metals and polychlorinated biphenyls (PCBs).^{1,2}

While specific sources of atmospheric deposition have not yet been identified, emissions inventories suggest that power plants and vehicles are major contributors. The largest single source of NO_x emissions in the region is Tampa Electric Company, whose Gannon and Big Bend facilities emitted a total of 88,000 tons of nitrogen oxides, or NO_x, in 1994.³ Annual NO_x emissions from all stationary sources in Hillsborough and Pinellas Counties exceeds 100,000 tons.⁴

Mobile sources such as cars and boats release an additional 45,000 tons of NO_x into the air each year in the tri-county area.⁵ But experts still don't know how much nitrogen from the emissions enters Tampa Bay, or what percentage of stormwater pollution entering the bay actually comes from the air.

The initial action plan for addressing atmospheric deposition relies heavily on research. U.S. Environmental Protection Agency's (EPA) selection in 1995 of the Tampa Bay NEP to participate in the Great Waters Program brought federal attention and funding to this effort. A task force comprised of researchers from EPA and representatives from local governments, agencies and utilities has been established to oversee the Tampa Bay Atmospheric Deposition Study. The detailed study plan includes research to identify sources, nutrients and toxic emissions in atmospheric deposition, as well as the impact of atmospheric deposition on stormwater runoff to the bay.

In 1996, the Environmental Protection Commission (EPC) of Hillsborough County and Pinellas County began an intensive air sampling study with funding from the NEP. Results of that effort will help quantify the amount of nitrogen entering the bay and provide additional clues to researchers investigating the sources of the pollution. Also in 1996, EPA's research vessel, the OSV Anderson, was deployed to Tampa Bay for a two-week tour to measure ammonia over the bay. That investigation revealed concentrations of gaseous ammonia in the East Bay sector of Hillsborough Bay that were more than 15 times higher than other stations monitored in Tampa Bay.⁶ Researchers are now investigating the sources of that ammonia and its relative impact on bay water quality.

STRATEGY:

STEP 1 Implement the Tampa Bay Atmospheric Deposition Study, which is expected to require three to four years for completion. The study will investigate:

- the relative contribution to atmospheric deposition from local and remote sources;
- the importance of ammonia to the total nitrogen input budget for Tampa Bay;
- the distribution of nitrogen deposition in the watershed;
- the contribution of dryfall to local atmospheric deposition;
- the contribution to stormwater runoff from atmospheric deposition in the watershed.

Staff from the Tampa Bay NEP and Florida Department of Environmental Protection's (FDEP) Air Quality Division will coordinate the study's first phase. Additional studies may be needed to identify specific sources of atmospheric deposition.

Responsible parties: *Tampa Bay NEP, in association with the Atmospheric Deposition Task Force*

STEP 2 Based on findings, develop an action plan that includes cost-benefit analyses of options to reduce atmospheric deposition. Options could include voluntary reductions in emissions; additional regulation or other requirements of power plants or motor vehicles; pollution prevention programs; reductions in the incineration of toxic materials through recycling; and revisions to federal, state and local rules.

A preliminary draft of this action plan will be prepared by the Tampa Bay NEP in cooperation with the Task Force by October 1998.

Responsible parties: *Tampa Bay NEP and EPA, in cooperation with the Atmospheric Deposition Task Force*

SCHEDULE:

Step 1 was initiated in 1995. Intensive sampling studies began in August 1996. A draft action plan to address atmospheric deposition to Tampa Bay will be prepared for Management Conference review in October 1998.

COST:

Costs for research associated with the Tampa Bay Atmospheric Deposition Study are estimated to range from \$200,000-\$500,000. More than \$400,000 has already been allocated by the NEP and EPA for this project. Other possible funding sources include the EPA Great Waters Program; EPA/FDEP 319(h) grant funds; Florida Pollution Recovery Trust Fund; Southwest Florida Water Management District's Surface Water Improvement & Management (SWFWMD-SWIM) program; Florida Department of Transportation; local government air programs; local utilities; Electric Power

AD-1

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Research Institute; and air emission permit or permit violation fees.

While action plans have not yet been developed, the following comparison illustrates the costs associated with reducing a ton of NOx from both power plants and motor vehicles.

Estimated costs to retrofit power plant "wet bottom" or "cyclone" (Group 2) boilers, which are used by some local facilities, range from a median of \$73 per ton of NOx removal from emission for wall-fired/wet bottom boilers up to \$635 per ton for cyclone furnace/wet bottom boilers.⁷ Assuming (only for purposes of comparison) that 100 tons of NOx translates into 1 ton of nitrogen entering the bay (as estimated in Chesapeake Bay studies), the costs to reduce 1 ton of nitrogen deposition to the bay range from \$7,300 to \$63,500. The four largest units in the region (TECO's Gannon 5-6 and Big Bend 1-2) are wall-fired units which may be able to reduce nitrogen deposition to the bay for less than \$10,000 per ton.

By comparison, EPA estimates that the cost of NOx control through vehicle inspection and maintenance programs to be about \$1,000 per ton of NOx removed from the air, or an estimated \$100,000 per ton of nitrogen deposition.⁸

EXPECTED BENEFITS:

Research will enable bay managers to allocate responsibility for the bay's cleanup and direct resources to areas of greatest need. Local air, water and sediment quality are all expected to benefit from actions to reduce or cap NOx and toxic emissions.

MONITORING ENVIRONMENTAL RESPONSE:

Atmospheric deposition monitoring began in 1996 and will continue throughout the duration of the three-year study. Long-term monitoring needs have not yet been determined.

REGULATORY NEEDS:

Regulatory changes may be called for in the action plan that is developed

RELATED ACTIONS:

AD-2

References, Atmospheric Deposition:

- * The Task Force for the Tampa Bay Atmospheric Deposition Study is comprised of representatives from EPA Region IV and the Great Waters Program; the Tampa Bay National Estuary Program; local government air, water quality and transportation departments; local utilities, and the state departments of transportation and environmental protection.
- 1 Estimates of Total Nitrogen, Total Phosphorus, and Total Suspended Solids Loadings to Tampa Bay, Florida, Technical Appendix. TBNEP Technical Publication #19-96 (1996).
- 2 Chemical Contaminants in the Tampa Bay Estuary: A Summary of Distributions and Inputs, TBNEP Technical Publication #01-95 (1995).
- 3 Attainment/Maintenance Plan for the Tampa Bay Florida Ozone Non-attainment Area, Environmental Protection Commission of Hillsborough County and Pinellas County Board of County Commissioners (1994).
- 4 Florida Department of Environmental Protection. 1994. Air Quality Report, 1994.
- 5 Ibid.
- 6 Preliminary data report for the July Tampa Bay ammonia project in 1996. Prepared by Pai-Yei Whung for Tampa Bay Atmospheric Deposition Study. (1996)
- 7 EPA Federal Register Vol. 61, No. 13, January 19, 1996.
- 8 D. Brezenski, EPA, personal communication to Tom Rogers, FDER, 1996.

AD-1

Promote Business and Public Energy Conservation

AD-2

ACTION:

Promote business energy conservation through participation in the U.S. Environmental Protection Agency's (EPA) Green Lights and Energy Stars programs. Continue to promote public energy conservation.

BACKGROUND:

Atmospheric deposition from stationary and mobile sources contributes nearly one-third of the bay's total nitrogen loading. Power plants are a major source of these emissions, and energy conservation can help to reduce demand on these facilities while saving customers money on their utility bills.

Local utilities already promote energy conservation to residents and businesses through incentives such as rebates for energy-smart heat pumps and free energy audits. These programs should be continued, and ratepayer literature developed for distribution with customer billings that discusses the link between energy use, air pollution and bay water quality, since that connection isn't readily made by most residents.

Of particular interest are businesses that are heavy energy users. Voluntary programs that help businesses reduce energy consumption are appealing because they prevent pollution, are non-regulatory and decrease overhead costs. The EPA sponsors three such programs: Green Lights, which targets light-intensive businesses such as hospitals and shopping malls; Energy Star Buildings, which focuses on a holistic approach to building efficiency; and Energy Star Office Equipment, which addresses energy-intensive computers, copiers, monitors, fax machines and printers.

Lighting accounts for 20-25 percent of all electricity sold in the United States—and lighting for industries, stores, offices and warehouses represents 80-90 percent of total lighting electricity use, so the use of energy-efficient lighting has a direct effect on pollution prevention. Every kilowatt-hour of lighting electricity not used prevents emissions of 0.7 kilograms of carbon dioxide (CO₂), 5.8 grams of sulfur dioxide (SO₂) and 2.5 grams of nitrogen oxides (NO_x), which are of particular concern in Tampa Bay. Energy Stars' participants further increase bottom-line business and environmental paybacks by addressing additional energy-demanding features within their facilities such as heating and cooling. Implementation of Energy Star programs may also reduce other pollutants associated with coal- or oil-fired power plants, such as mercury, a pollutant of concern for Tampa Bay.

Cox Newspapers, a Green Lights participant and owner of the *Atlanta Journal and Constitution*, estimates its annual savings at more than \$55,000 since upgrading its lighting. The company reduced its total annual electricity and its lighting electricity usage by more than 1.2 million kilowatt hours and 63 percent per kilowatt hour respectively at a 350,000-square-foot facility. These energy savings translated into a reduction of 1.6 million pounds of CO₂, 7.6 million grams of SO₂ and 2.7 million grams of NO_x per year.

Nationally, more than 1,800 businesses participate in Green Lights and Energy Stars, including approximately a dozen partners in the Tampa Bay region. This action calls for targeting an additional 100 businesses, and expanding cross-marketing opportunities through environmental agencies and local governments. For example, local governments promoting best management practices to reduce stormwater pollution through programs, such as Hillsborough County's Operation BayWorks and Adopt-A-Pond, can also promote business participation in Green Lights and Energy Stars to increase bottom-line benefits for participants and the environment.

AD-2**STRATEGY:**

- STEP 1** Develop and provide EPA with a target list of 100 light- and equipment-intensive businesses in the watershed, including hospitals and newspapers, for possible participation in the program. Also investigate possible reductions in exterior lighting if energy reductions can be made without compromising public safety.

Responsible parties: Tampa Bay NEP, in cooperation with local electric utilities, local government air quality and road departments, the Florida Department of Transportation (FDOT) and chambers of commerce.

- STEP 2** Sponsor a biennial workshop with EPA in the Tampa Bay Area, in partnership with other organizations.

Responsible parties: Tampa Bay NEP, local utilities, EPA

- STEP 3** Promote Green Lights and Energy Stars through local chambers of commerce, business associations and downtown partnerships, and seek their endorsements and commitments to promote these initiatives.

Responsible parties: Tampa Bay NEP, Agency on Bay Management (ABM), local utilities

- STEP 4** Encourage municipalities to promote energy conservation by requiring energy-efficient lighting and equipment in government buildings or by becoming Green Lights partners.

Responsible parties: local governments

- STEP 5** Increase cross-promotion of Green Lights and Energy Stars by local governments and environmental agencies in their contacts with businesses, and incorporate Green Lights concepts into their programs where applicable.

Responsible parties: local government stormwater and environmental management departments

- STEP 6** Encourage utilities to include information in customer billing newsletters about the link between energy usage and bay water quality and the benefits of energy conservation.

Responsible parties: Tampa Bay NEP, utilities and ABM

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SCHEDULE:

Target lists should be completed by September 1997 for 1998 workshops. All other steps can be initiated in 1997.

COST:

Staff time is involved in all steps. Business partners can expect cost savings associated with reduced energy use as a result of implementation.

EXPECTED BENEFITS:

Energy conservation will result in reduced emissions from power plants and atmospheric deposition to the bay.

MONITORING ENVIRONMENTAL RESPONSE:

Local participation in these EPA programs and associated pollutant reductions will provide a yardstick for measuring the success of this initiative. A study is underway to measure atmospheric deposition to Tampa Bay.

REGULATORY NEEDS:

None anticipated.

RELATED ACTIONS:

AD-1

WASTEWATER

Reclaiming treated wastewater for commercial and residential uses represents one of the most promising opportunities for reducing nitrogen loadings to Tampa Bay and conserving precious water supplies in the future. St. Petersburg's pioneering effort in reuse in the 1970s, which drastically reduced the city's direct discharges to the bay from its four treatment plants, paved the way for many of the projects now planned and underway. The City of Tampa is currently exploring ways to reclaim up to 50 million gallons of wastewater it now discharges daily to Hillsborough Bay, to relieve pressure on the region's potable water supplies.

But evaluations of reclaimed water projects must consider the net effect to the bay and its tributaries when large discharges are withdrawn. For instance, declines in nutrient loadings that may pollute the bay must be weighed against the impact of redirecting a freshwater source from the bay if that fresh water serves an important ecological role.

Once a pervasive problem for the bay, point-source pollution has declined substantially with improved regulation and advances in treatment technologies. In fact, the retooling of Tampa's Howard F. Curren wastewater treatment plant at Hookers Point in 1979 is widely regarded as a chief catalyst in the bay's water quality recovery. Advanced wastewater treatment technologies employed there and at other upgraded facilities can curb up to 90 percent of the nitrogen from treated wastewater discharges.

Direct or "point" discharges of wastewater to Tampa Bay from municipal sewage treatment plants and industries now contribute about 14 percent of total bay nitrogen loadings, roughly one-third of the amount contributed from "non-point" sources represented in stormwater runoff. These regulated point sources also contribute roughly 30 percent of the bay's total loadings of arsenic, cadmium, chromium and copper, as well as low levels of other contaminants.

Experts expect continued declines in point source pollution as the use of reclaimed water expands. Because point sources are concentrated and easily identified, they often are among the most cost-effective to treat. The strategy to address wastewater from point sources focuses on expanding the use of reclaimed water where projects are beneficial to the bay; improved treatment of industrial effluent; pollution prevention; and monitoring to improve compliance with discharge permits.

SEPTIC SYSTEMS

In some bay sectors, leachate from septic systems, which serve about 20 percent of the region's populace, may contribute substantially to nitrogen loadings. Preliminary studies by the Southwest Florida Water Management District (SWFWMD) also suggest that a proportionate amount of nitrogen loadings to the bay may come from disposal of septic waste and sewage treatment plant sludge containing nitrogen and heavy metals.

Septic systems located near the bay pose the greatest potential threat to water quality, particularly along creeks where flushing is limited and the water table is near the ground surface.

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SUMMARY OF ACTIONS FOR WASTEWATER

- WW-1 Expand the use of reclaimed water where reuse benefits the bay.
- WW-2 Extend central sewer service to priority areas around the bay now served by septic systems.
- WW-3 Require standardized monitoring of wastewater discharges.
- WW-4 Revise HRS rules to incorporate environmental performance or design standards for septic systems.

Expand the Use of Reclaimed Water Where Reuse Benefits the Bay

WW-1

ACTION:

Expand and encourage the reuse of highly treated domestic and industrial wastewater where reuse produces a net benefit for Tampa Bay.

BACKGROUND:

St. Petersburg's pioneering efforts in wastewater reuse for residential irrigation in the late 1970s were at the forefront of a technological movement that would offer both substantial benefits and some important challenges⁹ to a region anxious to conserve its freshwater supplies, and at the same time, save the bay from an overly rich diet of nutrients discharged in wastewater.

Today, projects to reclaim wastewater for irrigation and other applications are underway in all three counties bordering the bay. Local governments now reuse roughly 40 million gallons of treated wastewater per day, mostly for urban and agricultural irrigation, but also for industrial purposes. Projects planned or underway in local communities will more than triple that amount (see reuse table).

The Wilson-Grizzle Bill, which called for advanced technology to limit pollutants discharged to the bay from domestic wastewater facilities, was a driving force behind these early efforts and a lifeline for a polluted bay. The legislation prompted the City of Tampa in 1979 to upgrade its wastewater treatment plant at Hookers Point, a change that helped bring about sweeping improvements in the bay's water quality. At the same time, St. Petersburg was launching its reclaimed water project, which eliminated most of its direct wastewater discharges to the bay. The Wilson-Grizzle legislation was eventually repealed but a subsequent Grizzle-Figg bill reinstated the requirements for advanced wastewater treatment.

The potential benefits of reuse to the bay and to a water-thirsty region are substantial. Reuse already has helped to reduce annual nitrogen loadings to the bay and will play a key role in the strategy to reduce future nitrogen loadings — although reuse does not completely eliminate nitrogen loadings since some portion will eventually enter the bay in stormwater runoff. It is also widely recognized as a cost-effective, long-term alternative source of water for irrigation and commercial applications and potentially for potable needs. Reuse is a key element of the Southwest Florida Water Management District's (SWFWMD) New Water Source Initiative, a strategic blueprint designed to reduce the area's dependence on groundwater and protect the Floridan Aquifer from saltwater intrusion. SWFWMD's regional basin boards also have been instrumental in providing cooperative funding for innovative reuse programs.

Nevertheless, projects to reclaim wastewater should be evaluated carefully to determine their net impact to the bay and to address various public health and logistical concerns. The City of Tampa is now proposing a project to reclaim as much as 50 million gallons of the treated wastewater it discharges daily to Hillsborough Bay from its

WW-1

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Howard F. Curren facility at Hookers Point. Discharges from this facility now represent about 7 percent of the total freshwater inflow to Hillsborough Bay during the dry months of the year.

While the bay will benefit from the reduction in nutrients to this heavily impacted sector of the bay, a part of this load may be rerouted to the Tampa Bypass Canal, mixed with canal water, and then pumped to the Hillsborough Reservoir. Additionally, Hillsborough Bay will lose a portion of its freshwater inflow. A planning and environmental impact assessment for this project began in late 1995.

STRATEGY:

This strategy is to evaluate and recommend implementation of reclaimed water projects that result in a net benefit to Tampa Bay.

- STEP 1** Evaluate the environmental impacts of the major reuse projects planned for the Tampa Bay region, including the net effects of reducing or eliminating the discharge (changes in salinity and pollutant loadings) and any corresponding impacts to rivers and reservoirs. (See related action FI-1). Evaluations also should adequately address the project's ability to satisfy any public health concerns or perceptions stemming from the use of reclaimed water. Any environmental impacts associated with reuse projects should be balanced against the public need for cost-effective water supply alternatives.

The Tampa Bay National Estuary Program recommends implementation of those reuse projects that benefit the bay.

Responsible parties: local governments, SWFWMD, Florida Department of Environmental Protection (FDEP), West Coast Regional Water Supply Authority (WCRWSA), Florida Game and Fresh Water Fish Commission (FGFWFC)

- STEP 2** If current municipal and industrial reuse expansion plans coupled with other efforts to reduce pollution are insufficient to meet long-term goals for nitrogen management in the bay, investigate additional opportunities to expand reuse by interconnecting distribution systems or constructing larger storage facilities.

Responsible parties: local governments, SWFWMD, WCRWSA, in cooperation with the Tampa Bay NEP

SCHEDULE:

The status of major reuse projects that are planned or underway is provided in Table 1. Evaluation of the City of Tampa project to reclaim treated wastewater currently discharged to Hillsborough Bay began in 1995.

COST:

Estimated costs and funding sources for major projects are provided in Table 1. Information was provided by wastewater reuse coordinators, utility officials and environmental planners associated with these projects.

EXPECTED BENEFITS:

Reuse projects have the potential to substantially reduce long-term nitrogen loadings to Tampa Bay, and also help to conserve the region's water supplies. Both the amount of water conserved through a project and the anticipated reduction in nitrogen loadings are presented in Table 1. However, major projects should be balanced against any potential drawbacks for the bay or public health concerns associated with reuse.

MONITORING ENVIRONMENTAL RESPONSE:

Ambient water quality is monitored by local governments. Local government and industrial applicants for reuse permits also will be required to conduct water quality monitoring as a condition of the permit.

REGULATORY NEEDS:

FDEP regulations governing water reuse (FAC 62-610) are currently being revised to allow the use of reclaimed water to rehydrate wetlands within wellfields under specific conditions. A draft of the proposed rule changes is expected by late 1996. However, additional amendments may be needed to allow uses where there is a net environmental benefit for the bay. The issue of "ownership" of reclaimed water and control over how that water can be used also should be clarified.

RELATED ACTIONS:

FI-1, WQ-1

WW-1

Table 1. Summary of major projected or funded domestic wastewater reuse projects in the Tampa Bay region

Local Government	Plant/Project	Total Reuse Vol. (mgd)	Cost (in millions)	Funding Source	TN reduction (tons/yr)	Project Status
Hillsborough County	NW Service Area: 1) River Oaks, NW Reg. WWTP - Service to residential and commercial uses and golf courses, and connection to Dale Mabry/Van Dyke WWTP- 2) Dale Mabry/Van Dyke WWTP - extend service to an additional 1,550 residences	15.0	15.0 44.0	County CIP, SWFWMD RWIU*	34.5	9-phase county project to be completed by the year 2000, as part of 5-year CIP*. Distribution to individual residences is part of 20-year plan with expected completion in 2015.
	Central Service Area: 1) Connect Valrico & Faulkenburg WWTPs; extend service to golf courses and residential areas; construct storage facilities; inter-connect with raw water line to Cargill plant.	16.0	10.0 15.0	County CIP, user fees, SWFWMD RWIU	36.5	WWTP connection lines and storage facilities in design phase. Construction part of 5-year CIP with expected completion in 2000.
	South Service Area: 1) South County Reg./ Summerfield WWTP - Extend service area and hook up additional homes	6.5	3.3	County CIP, user fees	14.8	Part of 20-year plan, with expected completion in 2015.
Tampa	Howard Curran WWTP - AWT effluent to Hillsborough River Reservoir or Tampa Bypass Canal, to augment potable water supply	50.0	100	User fees, SWFWMD, State, bonds	137.0	Begin design in 1996. Projected to be on-line in 2000.
Plant City	Effluent to CF Industries, agricultural users	8.0	14.0	Plant City Util. board, SWFWMD (Gov. board & Hills. River Basin Board)	18.3	Pending; expected to be on-line by 1998-1999.
Pinellas County	North Plant - extend service to 500 additional homes (if flow available)	9.0	NA	NA	20.6	Underway; expected completion by 1998-1999. This represents the county's maximum reuse capacity.
	McKay Creek & South Cross Bayou -WWTP upgrade, transmission main, infill lines	23.0	23.0 phase 1 60.0 phase 2	User fees, bonds, CIP, SWFWMD, State	52.5	
St. Petersburg	NE, SE, SW, Albert Whitted Plants - expand overall distribution network, adding 5000 additional homes	4.2	20.0	User fees, SWFWMD	11.4	Expected completion by 2005.

Table 1. Summary of major projected or funded domestic wastewater reuse projects in the Tampa Bay region (continued)

Local Government	Plant/Project	Total Reuse Vol. (mgd)	Cost (in millions)	Funding Source	TN reduction (tons/yr)	Project Status
Clearwater	No new reuse projects are planned					
Safety Harbor	No new reuse projects are planned					
Oldsmar	City to treat East Lake Woodlands wastewater, return to golf courses	0.3	4.5	User fees, SWFWMD	0.68	Expected completion by 1997.
Largo	Increase reuse from 6 to 12 mgd	6.0	8.0	User fees, SWFWMD	13.7	Expected completion by 2000.
Manatee County	Network SW, SE, and N Plants - expand distribution to county residences and homes in west Bradenton, and east to agricultural areas (MARS*)	17.2	50.0	Federal grant, 50/50 SWFWMD	39.3	Expected completion by 1999.
Bradenton	AWT Discharge to augment Braden River flow	6.0	3.5	User fees, bonds, SWFWMD	13.7	Feasibility study initiated; timetable not projected for implementation.
Palmetto	1) Distribution main to Frog Creek area (agriculture), in cooperation with Manatee Co. (MARS)	1) 0.9	1) 3.5	User fees, CIP funds, SWFWMD funds, County funds	2.74	Will reuse 90% of their effluent by 2000.
	2) Distribution system to city parks, golf course, schools	2) 0.3	2) 1.1			
Polk County	no new reuse projects are planned					
Lakeland	no new reuse projects are planned					

* RWIU - Reclaimed Water Improvement Unit. Similar to special taxing district, used to fund reuse water systems within county subdivisions.

CIP - Capital Improvement Plan

MARS - Manatee Agricultural Reuse System

Calculation of TN reduction is based on the difference between TN load from direct surface discharge to the bay from WWTPs and TN load associated with wastewater reuse.

Extend Central Sewer Service to Priority Areas Now Served by Septic Systems

ACTION:

Extend central sewer service to high-density areas along the bay and its tributaries where water quality problems associated with residential and commercial septic systems have been documented.

BACKGROUND:

Preliminary studies conducted for the Southwest Florida Water Management District (SWFWMD) suggest that leachate from septic tank drainfields may contribute about 5 percent of the bay's total annual nitrogen loadings and significantly more in localized areas. Malfunctioning septic systems can also contribute bacteria and viruses (pathogens) associated with fecal coliform in human waste to surface waters. Ground water carries nitrogen from septic tank drainfields to surface waters. Septic systems located closest to the bay and its tributaries pose a particular concern.

There are nearly 100,000 septic systems in the Tampa Bay watershed. Areas that demand close scrutiny for water quality impacts from these systems include creeks where flushing is limited and the water table is close to the surface of the land, and other nearshore areas of the watershed with high densities of mostly older systems. Among these are Allen's Creek in Pinellas County, several creeks and the Ruskin inlet near the mouth of the Little Manatee River, and Tampa's McKay Bay.

Elevated levels of fecal coliform and nitrogen have been reported in many of these and other areas around the bay. But only a few site-specific studies have been conducted to directly link septic systems to these impacts, which may also be due to natural causes or animal waste carried in stormwater runoff. Nevertheless, the sandy soils in Southwest Florida are not highly suitable for septic systems, and preliminary studies point to the potential for nitrogen impacts in some areas.

This action calls for further investigations at suspected problem sites to document the impact from septic systems, along with efforts to extend central sewer service to areas where problems are identified. Areas with septic systems installed prior to 1983 and nearshore areas with high densities of septic systems should be evaluated first.

Conversion from septic to central sewer service can be costly, with residential hook-up fees ranging anywhere from \$2,000 to \$5,000 or more. This underscores the need to investigate financing options such as interest-free loans and cost-share grants or partnerships to assist residents in areas slated for central sewer service. Additionally, the availability of central sewer service may encourage higher-density development in these environmentally sensitive areas, and local governments should take this into consideration in their long-range planning programs.

STRATEGY:

- STEP 1** Identify areas adjacent to the bay and its tributaries where residential and commercial septic systems are suspected of causing water quality impacts. Areas with septic systems installed prior to 1983, when siting criteria was established, should be given high-priority status.

Responsible parties: local governments, public health departments

- STEP 2** Analyze worst-case scenarios for nitrogen loadings from septic systems based on their proximity to the creek or surface water. Where necessary and cost-effective, install meters and wells to monitor groundwater seepage into the creeks or affected areas. A remote sensing technique employed by the Tennessee Valley Authority to detect areawide drainfield failures may be a useful monitoring tool.

Responsible parties: local governments, Florida Department of Environmental Protection (FDEP), public health departments

- STEP 3** Based on results from steps 1 and 2, extend central sewer service to coastal areas where water quality problems have been documented, except where legal or budgetary constraints exist.

Responsible parties: local governments

- STEP 4** Distribute educational brochures promoting best management practices (BMPs) for septic tanks (see Pinellas County brochures developed for the Allen's Creek watershed).

Responsible parties: local government

- STEP 5** Evaluate the use and effectiveness of fecal coliform as an indicator of public health concerns.

Responsible parties: Tampa Bay NEP

- STEP 6** For new or existing developments where central sewer service is available or feasible, develop and implement a local regulation to require its utilization. Where central sewer service is not feasible, determine the most environmentally beneficial means to provide sewage treatment.

Responsible parties: local governments

SCHEDULE:

Local governments can begin implementation of Steps 1 and 2 in 1997.

Implementation of Step 3 will depend on results from analyses and cost and financing factors. Step 4 will be initiated as funding becomes available. Step 5 can be pursued in 1997. Conversion from septic to central sewer service is already underway in some areas as part of existing capital improvement plans.

COST:

Costs to analyze water quality in suspected problem areas may be upwards of \$2,000, based on 10 samples at \$200 each. Sampling for viruses or other pathogens, if deemed necessary, would increase those costs. Monitoring of wells and seepage meters is esti-

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mated at \$125-\$250 per station. Funding options for residents converting to central sewer service must be developed to make implementation affordable and feasible.

EXPECTED BENEFITS:

Efforts to convert high-density coastal areas served by septic systems to central sewer service will help to reduce nitrogen and pathogen levels in the bay and bay tributaries, making these areas safer for swimming and other watersports. Additionally, improved conditions may allow for the re-classification of restricted shellfish harvesting areas.

MONITORING ENVIRONMENTAL RESPONSE:

Nutrient loadings from on-site septic systems traditionally have been hard to quantify, however monitoring and modeling called for in this action will assist in this effort.

REGULATORY NEEDS:

Revisions to local government comprehensive plans and the development of implementing ordinances.

RELATED ACTIONS:

WW-4, PH-3

Require Standardized Monitoring of Wastewater Discharges

WW-3

ACTION:

Require standardized monitoring of wastewater discharges from industrial and municipal facilities, and improve regulatory and public access to permit compliance monitoring data.

BACKGROUND:

Improvements in the monitoring and reporting standards governing industrial and municipal facilities discharging wastewater to Tampa Bay will improve the accuracy of information used to develop bay water quality models and pollution control standards — efforts that will lead to improved environmental oversight. Inadequacies in the existing system prevent effective trends analysis and limit the public's and regulatory community's ability to effectively monitor discharges.

Standardized units of measurement for wastewater concentrations and flows are necessary to calculate wastewater loadings to the bay. Municipal wastewater treatment facilities currently are required to report standardized flow measurements, but some industrial point sources are not. Furthermore, requirements to report the concentration of nutrients or other contaminants in wastewater vary considerably.

Efforts also are needed to improve local government, agency and public access to data collected from these facilities. Most computerized permit compliance data is available only through the Tallahassee or District offices of the Florida Department of Environmental Protection (FDEP), and often requires extensive time and effort for retrieval.

This action calls for the standardized reporting of a core group of parameters from all point-source facilities discharging more than 100,000 gallons per day, and improved access to monitoring data collected from these facilities.

STRATEGY:

STEP 1 Require the measurement and reporting of a core group of parameters from all point-source facilities in the Tampa Bay watershed with National Pollutant Discharge Elimination System (NPDES) permits discharging an average daily flow of more than 100,000 gallons of wastewater.

The core group should include concentrations of total nitrogen, total phosphorus, total suspended solids, total ammonia, and average daily or monthly flow (actual discharges, not values estimated in permits). These core parameters are in addition to any permit-specific reporting that may be required. An exemption may be allowed for parameters which that facility is not reasonably expected to discharge. Revisions to existing permit criteria should be added as permits are renewed, pending an evaluation of additional costs associated with additional sampling requirements.

Responsible party: FDEP, local governments

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STEP 2 Enforce the use of standard reporting units for the core group of parameters, including flow rate. Nutrient concentrations are required as milligrams per liter (mg/l); flow is reported as average daily flow or monthly flow (mgd or mgm).

Responsible party: FDEP (for permitting), applicable point-source facilities (for standardized monitoring and reporting)

STEP 3 Monitor the centralized data entry process instituted in 1996 by the FDEP to ensure timely updating of permit files within 30 days from the time a compliance report is submitted.

Responsible party: Tampa Bay NEP

STEP 4 Improve access to the FDEP computerized database for permit compliance at the regional level through District offices. Currently, FDEP's Southwest District and the Environmental Protection Commission (EPC) of Hillsborough County have access to the main data base, but other interested parties must request data retrievals from FDEP District or Tallahassee staff. They must either go to the District office to review the information, or have it mailed to them. Access to this database should be available in a more timely fashion through the Internet or on disk.

Responsible party: FDEP Tallahassee and District offices

SCHEDULE:

All steps can be initiated in 1997.

COST:

Staff time is associated with efforts to improve and provide more timely access to the compliance monitoring database. Administrative costs also will be incurred if rule revisions are needed to mandate additional sampling of core parameters. The costs incurred by point-source facilities to comply with standardized sampling and monitoring criteria should be evaluated.

EXPECTED BENEFITS:

Improved monitoring standards will improve the data used to develop bay water quality models that are the basis for many of the most significant management actions for the bay.

MONITORING ENVIRONMENTAL RESPONSE:

Results will be measured in improved data quality and accessibility.

REGULATORY NEEDS:

Revisions to FDEP Rules 62-4 or 62-620 may be necessary to include measuring and reporting standards for a core group of parameters in each NPDES permit.

RELATED ACTIONS:

WW-2

Revise HRS Rules to Incorporate Environmental Performance or Design Standards for Septic Systems

WW-4

ACTION:

Revise the rules of the Department of Health and Rehabilitative Services (HRS) governing septic system siting and monitoring to incorporate environmental performance or design standards that protect the bay and further assure public health and safety.

BACKGROUND:

Preliminary studies conducted for the Southwest Florida Water Management District (SWFWMD) indicate that as much as 5 percent of the bay's total nitrogen loadings may come from the nearly 100,000 septic systems in the Tampa Bay watershed.

The Florida Department of HRS currently oversees and approves the siting and monitoring of all on-site sewage treatment systems with a capacity of 10,000 gallons per day or less, including septic and other on-site disposal systems. Although Florida's septic system permitting criteria (Florida Administrative Code [FAC], Chapter 10D-6) are more stringent than most other states, regulations focus mainly on public health interests and do not include potential impacts from water pollution except those that relate to bacteria and viruses and the contamination of public drinking water supplies.

A January 1995 revision allows HRS to consider impacts to ground and surface waters from septic systems, but leaves the basic siting and design standards essentially unchanged. For example, the rule does not contain effluent quality standards pertaining to nutrients that leach from septic systems to ground water and surface water, except in the Florida Keys. Proposed maintenance schedules are included, but they are advisory only.

Furthermore, septic systems constructed prior to the establishment of the current design criteria may continue to operate — even in high-density areas where their presence may aggravate local water quality problems — as long as the load to them does not change substantially.

This action is to develop environmental performance or design standards for the design and siting of septic systems and to incorporate these guidelines into HRS regulatory guidelines. This process should begin with a determination of the allowable concentrations or loadings of nitrogen and pathogens to surface waters. Environmental performance standards could then be established to require a minimum level of nitrogen removal from on-site disposal systems. However, since these criteria may be difficult to establish and enforce, officials may opt to develop design and operating standards that would help to prevent nitrogen contamination of ground or surface waters from septic tanks. Design standards could include stricter setbacks from surface waters, minimum wet-season water table depths, soil permeability and content, and recommended maintenance intervals. At sites where performance standards cannot be

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met, local governments may require on-site disposal systems with nitrogen-removal capability.

Regular and timely maintenance of existing septic systems also is important, and could negate the need for more stringent design criteria. The cost of pumping out a septic system is about \$250. Although health officials recommend that septic systems be pumped out at least every three years, many residents postpone maintenance until a problem is apparent. Thus, this action also seeks to better educate residents about the link between septic systems and potential water quality problems, and promote regular maintenance of these systems.

Finally, this action calls for the development of a statewide septage and sludge disposal tracking system to more effectively monitor handling and disposal practices and associated impacts. Monitoring sewage sludge is an important problem, particularly in the Hillsborough and Manatee river basins, because of the number of permitted disposal sites. Different agencies regulate disposal sites and it is difficult to determine how much material is being spread and how it is handled.

STRATEGY:

STEP 1 Conduct a workshop to develop environmental performance or design standards for septic systems. Participants should include the U.S. Environmental Protection Agency (EPA), HRS, Florida Department of Environmental Protection (FDEP), local health departments and the Florida National Estuary Programs. Workshop participants should also explore the feasibility and availability of cost-sharing programs to assist homeowners in retrofitting or replacing existing septic systems in areas with documented water quality problems.

Responsible parties: Tampa Bay NEP, FDEP, HRS, local governments

STEP 2 Evaluate whether the environmental design criteria should be implemented through a statewide rule change or local ordinances.

Responsible parties: HRS, local governments

STEP 3 Determine and promote the minimum schedule for septic system maintenance based on environmental standards in cooperation with private companies that provide pump-out services. Residents also could be encouraged to perform routine inspections and maintenance of septic systems by including reminders and educational materials in local utility or water bills.

Additionally, require that septic systems be pumped out at time of property transfer, or that the property owner provide documentation that the system has been pumped out within the previous three years.

Responsible parties: local governments with assistance from local health departments in implementing property transfer criteria

STEP 4 Develop a statewide septage and sewage sludge tracking and monitoring program to improve oversight of material handling and disposal.

Responsible parties: FDEP and HRS

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CHARTING
the **COURSE**
FOR TAMPA BAY

SCHEDULE:

All steps can be initiated in 1997.

COST:

Administrative costs and staff time only are anticipated in this action, but the environmental standards that are developed may require additional resources for environmental protection. If a statewide rule revision is deemed necessary, HRS and legal staff time to revise the current rule is estimated at \$50,000.

WW-4

EXPECTED BENEFITS:

The establishment of environmental performance or design standards for septic systems will help reduce nitrogen loadings to the bay and prevent future siting of septic systems in areas vulnerable to water quality impacts.

MONITORING ENVIRONMENTAL RESPONSE:

Ambient water quality is monitored by local governments.

REGULATORY NEEDS:

Possible revisions to FAC Chapter 10D-6 or local ordinances to incorporate environmental performance or design standards for septic systems.

RELATED ACTIONS:

WW-2, PH-1



TOXIC CONTAMINATION

Stormwater treatment, pollution prevention and improved hazardous waste disposal are key components of the strategy to reduce the amount of toxic contaminants entering the bay.

Recent studies by the National Oceanic & Atmospheric Administration (NOAA) point to contamination of bay sediments at several sites around the bay by heavy metals, pesticides and other substances that at sufficiently high concentrations can be damaging or deadly to marine life.

Sediments from Hillsborough Bay, the bay's most industrialized sector and home to the Port of Tampa, generally revealed the highest levels of contaminants. Concentrations of cadmium, lead and zinc at Hillsborough Bay exceeded Florida's Probable Effects Level (PEL) for toxic contamination, guidelines that predict biological impact to marine life. Pinellas County's Boca Ciega Bay and Bayboro Harbor also ranked among the bay's hot spots of contamination.

Many toxic pollutants enter the bay attached to sediments in stormwater runoff, but atmospheric deposition (associated with industrial and vehicle emissions) and wastewater discharges also contribute significant quantities of contaminants to the bay. Pollutants tend to concentrate around ports, marinas and industrial harbors, as well as major stormwater outfalls.

Overall, toxic parameters in the bay's sediments are in the middle ranges nationally. Among 200 sites studied nationwide, samples of oysters from rural Cockroach Bay ranked third nationally in 1988 in total concentrations of the insecticide chlordane, which was banned that year. Sediments there also revealed high levels of the pesticide DDT, which was banned in the early 1970s, but persists in the marine environment.

To assess overall bay bottom quality, the Tampa Bay NEP will utilize a trio of tests, evaluating sediment chemistry, toxicity, and the health and diversity of bay bottom communities. Results from these analyses will be used to classify areas of the bay that are heavily contaminated, exceeding threshold levels for biological impact, and for which sediment remediation may be considered; those that are polluted but more readily restorable by reducing or maintaining existing pollutant loads; and toxic-free areas that should be protected from contamination. Management actions will vary according to sediment classification, the type of pollutants present and technical feasibility.

Results of a recent risk assessment conducted for the Tampa Bay NEP indicate that some metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and pesticides are present at concentrations with a significant potential for causing toxic effects to fish and wildlife, either through direct exposure to the sediments, or indirectly through the food web. The first phase of the study, completed in 1996, evaluated the potential risks to marine organisms and human health from pollutants in Hillsborough and Boca Ciega bays, two of Tampa Bay's most impacted sectors.

The primary contaminants of concern identified in the study include metals (particularly chromium, copper, mercury and nickel); PAHs; PCBs; and chlorinated pesticides. Stormwater runoff and atmospheric deposition transport the vast majority of these pollutants to the bay. Both PCBs and chlorinated pesticides aggressively persist in the marine environment, posing potential hazards long after the use of a particular chemical has been restricted.

Several state advisories have been issued urging limited consumption of Gafftopsail catfish, Crevalle jack, ladyfish, Spanish mackerel and certain shark species in Tampa Bay and other Florida coastal waters based on the total mercury detected in them. The Department of Health and Rehabilitative Services recommends that these fish not be consumed more than once a month by children or women of childbearing age, or more than once a week by other adults.

Mercury in fish flesh appears predominantly as methylmercury which is readily absorbed by the human digestive system. Consumption of excess amounts of methylmercury over a prolonged period of time produces toxicity in the central nervous system. Children are particularly sensitive to mercury. Exposure during pregnancy is known to cause toxic effects in the fetus. The Florida Department of Environmental Protection is sponsoring research into the causes of the mercury problem in Florida and potential control strategies.

The second phase of the NEP risk assessment will focus on Bayboro Harbor and the western edge of Old Tampa Bay near Allen's Creek. These investigations are helping to identify which pollutants pose a continuing threat to the bay and those that represent past or inactive sources of pollution. The findings will be used to develop a more targeted action plan to address toxic contamination in 1997.

Summary of Actions to Address Toxic Contamination

- TX-1 Address hot spots of toxic contamination.
- TX-2 Improve opportunities for proper hazardous waste disposal.
- TX-3 Reduce toxic contaminants from ports and marinas.
- TX-4 Promote integrated pest management on farms to reduce pesticides in runoff.

Toxic contaminants also are addressed in the Action Plans on Atmospheric Deposition, Stormwater Runoff and Wastewater.

Address Hot Spots of Contamination

TX-1

ACTION:

Address hot spots of toxic contamination in the bay's most heavily impacted basins.

BACKGROUND:

A 1996 risks assessment conducted for the NEP in Hillsborough and Boca Ciega bays indicates the presence of some contaminants at concentrations that could pose significant harm to fish and wildlife either through direct contact with the sediments or indirectly through the food web. These contaminants include metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and pesticides.

To evaluate the risks associated with sediment contaminants, researchers compared toxicity levels for each contaminant with potential exposures to fish and wildlife. A key aspect of the investigation was to assess toxic effects resulting from bioaccumulation, the tendency for some contaminants to increase in concentration as they travel up the food chain. This poses a greater risk to predators that consume smaller fish and organisms. The study also assessed the potential for human health risks from eating fish caught in Hillsborough and Boca Ciega bays. The second phase of the risk assessment, focusing on Bayboro Harbor and the western coast of Old Tampa Bay, will be finalized in early 1997.

The primary contaminants of concern in Hillsborough and Boca Ciega Bays are metals (chromium, copper, mercury, silver and nickel); PAHs; PCBs; and chlorinated pesticides. Atmospheric deposition and stormwater runoff convey the bulk of these pollutants to the bay. Mercury loadings are linked to atmospheric deposition, while chromium and copper tend to enter the bay in stormwater runoff. A 1995 state health advisory urged Florida residents to limit their consumption of certain fish in Tampa Bay and other coastal waters because they contained elevated levels of mercury.

The top anthropogenic sources of PAHs include air pollution from the combustion of fossil fuels, waste incinerators and open-burning fires, as well as runoff from roadways.

Atmospheric deposition also is considered responsible for the majority of PCBs and chlorinated pesticides entering the bay. PCBs are released in direct discharges from industrial facilities to municipal sewage treatment plants, leachate from waste disposal sites, incineration and the re-use of transformer oil. They also can enter the bay in stormwater runoff when contaminated soils are disturbed, for example, during farming or construction. Both PCBs and chlorinated pesticides are very persistent in sediments and tend to bioaccumulate in organisms.

Chlorinated pesticides of significant concern are DDT, chlordane, endrin, heptachlor epoxide and lindane. Each of these has been banned or heavily restricted due to its potential toxicity to fish and wildlife. Banned in 1972, the insecticide DDT was primarily used on crops, but also employed extensively in ditches, swamps and marshes for mosquito control. Endrin was used as a general pesticide to control insects, rodents

and birds until 1986. Heptachlor was manufactured for use as an insecticide, but has been restricted since 1983 except for use in controlling termites. Lindane has not been produced in the U.S. since 1977. Lindane is less toxic to fish and wildlife and less likely than other chlorinated pesticides to bioaccumulate in animals tissues.

Stormwater treatment is a key strategy in toxics reduction, since many toxic contaminants enter the bay attached to sediments in runoff. The NEP is funding a project in 1997 to identify local and regional stormwater treatment projects that reduce the flow of contaminants to areas of greatest concern.

Best management practices (BMPs) to reduce total suspended solids (TSS) in runoff include retention ponds, vegetated buffer strips, swales and underdrains, as well as non-structural means such as street sweeping or stricter zoning standards to limit development density in sensitive areas. Treatment methods that address large or multi-parcel sites are preferred, since they increase the likelihood of operational success and may offer an added opportunity for habitat creation.

In areas of long-standing sediment contamination, where the source of pollution is no longer active, bay managers may consider the cost-effectiveness of other techniques such as sediment capping or removal.

STRATEGY:

The NEP strategy to address hot spots of contamination is to identify and implement priority stormwater treatment projects, continue efforts to identify specific sources of contamination and source-control strategies, and continue to monitor the bay to assess changes and trends. Atmospheric deposition, which is responsible for a significant amount of toxic contaminants loadings, is addressed in a separate action plan.

STEP 1 Implement local and regional projects identified in the NEP's Priority List of Projects to Address Toxic Contamination, slated for completion in 1997. Projects will emphasize stormwater improvements in heavily contaminated basins, but may also include point-source control or pollution prevention strategies in specific basins.

If stormwater improvements and source-control strategies fail to achieve adequate results, consider options for and feasibility of sediment cleanup or containment.

Responsible parties: *local governments, Florida Department of Environmental Protection (FDEP)*

STEP 2 Continue to monitor sediment chemistry, toxicity and benthic communities to assess changes and trends.

Responsible parties: *local governments*

SCHEDULE:

Step 1 can be initiated in 1997 following completion of the second phase of the risk assessment and identification of priority projects to address toxic contaminants. Step 2 is ongoing.

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COST:

Costs to implement stormwater improvements and other controls depend on the method selected. Possible funding sources include Southwest Florida Water Management District's Surface Water Improvement & Management program (SWFWMD-SWIM) through District basin boards, local government stormwater utilities' operating and maintenance budgets, and permit application fees. Sediment chemistry and benthic monitoring for the bay is estimated to cost \$195,000 per year. The Tampa Bay NEP has developed a computer model to use in selecting the most cost-effective mix of techniques to employ in a given area.

EXPECTED BENEFITS:

Reduced toxic contamination of bay sediments and associated risks to marine life and human health as a result of reduced pollutant loadings and other efforts to contain or restore heavily impacted areas.

MONITORING ENVIRONMENTAL RESPONSE:

Ongoing benthic and sediment chemistry monitoring by local governments, together with monitoring requirements for National Pollutant Discharge Elimination System (NPDES) permits, will be used to assess the effectiveness of management actions to reduce toxic contaminants in the bay. Local monitoring will supplement NOAA studies.

REGULATORY NEEDS:

None anticipated.

RELATED ACTIONS:

AD-1, TX-3, SW-4

Improve Opportunities for Proper Hazardous Waste Disposal

TX-2

ACTION:

Improve hazardous waste disposal by small businesses and residents by evaluating opportunities to better serve or educate these markets.

BACKGROUND:

Florida generates about 718,000 tons of regulated hazardous waste each year, including approximately 116,000 tons from the Tampa Bay region. Experts estimate that another 10-20 percent is generated by unregulated sources, including residents and conditionally exempt small quantities generators (CE-SQGs) — businesses that generate less than 100 kilograms (kg), approximately 25 gallons, of hazardous waste per month (or 1 kg of acutely toxic hazardous waste) and whose waste disposal is not strictly regulated.

Households and CE-SQGs are an important source of pollution. Improper handling, storage and disposal of hazardous materials can lead to air, soil, surface water and groundwater contamination, which can directly or indirectly impact the bay and public health and safety. Of key concern are hazardous materials such as paints, pesticides, batteries and other chemicals discarded with trash, and materials released (accidentally or intentionally) on the ground, in storm drains or in sanitary sewer systems. Landfills receiving hazardous waste are not specially equipped to deal with these materials, which are buried in pits.

These materials are often discarded with trash because access to hazardous waste collection facilities in most areas is limited, either by hours of operation or by location. Hillsborough County, for example, operates two household hazardous waste facilities, in Apollo Beach and on Sheldon Road (Town & Country), which are open one week-end per month at alternating sites. But cities such as Tampa and Temple Terrace, and communities such as Brandon, are not served by household hazardous waste collection facilities, although residents may use sites in unincorporated Hillsborough County.

Options for small businesses also are limited, mainly because increasing service to these markets can be costly and complex. In Hillsborough County, CE-SQGs may transport their waste to the County's Orient Road facility on Wednesday mornings, under an arrangement with Universal Waste, which operates the facility. However, there are no real incentives for businesses to use the facility, which assesses a charge for the waste it receives. Pinellas and Manatee counties also provide household hazardous waste collection and attempt to assist small businesses in properly disposing of hazardous wastes.

This action calls for improving community and CE-SQG opportunities for proper hazardous waste disposal by exploring options to better serve and educate these markets,

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including whether to establish permanent household hazardous waste collection facilities in major communities not currently served.

STRATEGY:

STEP 1 Organize a task force to evaluate methods to improve opportunities for hazardous waste disposal for small businesses and residents, such as:

- promote “milk run” services, in which haulers arrange to pick up waste from CE-SQGs on days they service municipal landfills;
- evaluate the feasibility of raising occupational license fees to “pre-pay” waste disposal costs, instead of charging for the service later;
- allow CE-SQGs to use household hazardous waste collection facilities;
- provide mobile collection service at central sites several times a year, perhaps in conjunction with large events that draw high attendance;
- expand existing service either by expanding weekend hours of operation, providing recycling “swap shops” — such as the one operated by Pinellas County — or siting additional permanent facilities where demand has been justified;
- encourage broader utilization of existing facilities by increasing promotion, and develop partnerships with major retail stores to promote municipal collection facilities;
- organize neighborhood pick-up days in cooperation with programs such as Adopt-A-Pond, Florida Yards & Neighborhoods and LakeWatch;
- develop partnerships with manufacturers to assist in the collection and recycling of materials such as paint.

Additionally, evaluate ways to reduce consumer demand/consumption of hazardous waste materials by promoting “green” shopping through partnerships with major retailers.

Responsible parties: Florida Department of Environmental Protection (FDEP) and Tampa Bay NEP to organize workshop

The task force should include city and county hazardous waste/solid waste coordinators, FDEP, CE-SQG program coordinators, user groups and the NEP

STEP 2 Encourage the City of Tampa and other unserved communities to evaluate the cost-effectiveness of establishing permanent household hazardous waste collection facilities.

Responsible parties: Local governments, FDEP

STEP 3 Cross-market and aggressively promote pollution prevention programs such as the FDEP's P2 Program and Hillsborough County's Operation BayWorks. The P2 program offers businesses free and confidential on-site assessments to assist them in reducing their waste stream and costs. Operation BayWorks assists target business sectors in developing pollution prevention plans by offering industry-specific best management practices and technical assistance.

- Distribute promotional flyers on the P2 Program (and Operation BayWorks in Hillsborough County) in mailings to/meetings with CE-SQGs.
- Promote these programs through local chambers of commerce and the University of South Florida small business development center, through chamber publications and presentations. Invite chambers to serve as partners in promoting the concept of Businesses for a Cleaner Future by aggressively promoting these services and targeting 100 chamber members for participation/sign-up during a given time period.

Responsible parties: local governments, Hillsborough County Environmental Protection Commission's CE-SQG Program, in cooperation with chambers of commerce, FDEP

STEP 4 Develop summary recommendations from steps 1 to 3 for review by the Community Advisory and Management Committees of the Tampa Bay National Estuary Program.

Responsible parties: Task Force

SCHEDULE:

All steps can be initiated and completed in 1997.

COST:

All steps require staff and administrative time. Implementation costs will vary according to recommendations. Costs to construct and operate a permanent household hazardous waste collection facility vary depending on design and level of service. The Pinellas County facility, built within a Class 1 landfill, cost between \$300,000 to \$400,000 to construct. Potential funding sources include local governments and state agency grants.

EXPECTED BENEFITS:

Improvements in hazardous waste disposal will help to reduce toxic contaminants that enter the bay in stormwater runoff, or through groundwater, wastewater or atmospheric deposition.

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MONITORING ENVIRONMENTAL RESPONSE:

Municipal solid waste departments track both the amount of hazardous waste they receive and statistics on usage. These can be evaluated as recommendations are implemented to measure progress. Local governments conduct bay sediment sampling to track the amount and distribution of toxic contaminants in the bay.

REGULATORY NEEDS:

None anticipated.

RELATED ACTIONS:

TX-1, TX-3

Reduce Toxic Contaminants from Ports and Marinas

ACTION:

Reduce toxic contaminants from ports and marinas by aggressively promoting voluntary business waste stream assessments and pollution prevention programs.

BACKGROUND:

Studies by the National Oceanic & Atmospheric Administration (NOAA) have revealed relatively high levels of sediment contamination at some sites in Tampa Bay. The most tainted sediments were found in northern Hillsborough Bay near the Port of Tampa, especially in Ybor Channel and adjoining waterways. Other hot spots of contamination include Bayboro Harbor, Boca Ciega Bay and portions of western Middle Tampa Bay.

Toxic contaminants in Tampa Bay tend to concentrate around ports and marinas, industrial harbors and major stormwater outfalls. Shipyards and related port and industrial facilities release toxic substances to the bay mainly in stormwater runoff, but also through industrial wastewater discharges and through the air. Substances may include petroleum products, metals, metal treatment chemicals and anti-fouling paints, and contaminants associated with ship repair and scrap iron stockpiles.

Marinas located at the water's edge also are key sources of pollution. Pollutants associated with marinas and boating include oil and oil-based products discharged to the bay in bilge water and during engine maintenance, boat repair and fueling; paints, lacquers, thinners, strippers and solvents; and sewage, detergents and gray water discharged directly from boats.

This action calls on the Florida Department of Environmental Protection (FDEP) to promote its P2 Program to local ports and marinas. The NEP also urges local government waste management programs to focus more attention on these businesses. P2 provides confidential and free waste stream assessments and recommendations on ways companies can reduce pollution from their facilities. Local governments provide education and outreach through their hazardous waste and small quantities generator (SQG) programs.

Additionally, the NEP recommends that a local workgroup evaluate several of the top regional and national pollution prevention programs targeting marinas and boaters, including materials from Puget Sound and Chesapeake Bay, for possible application in Tampa Bay.

All states are required by recent amendments to the Coastal Zone Reauthorization Act (CZRA) of 1990 to adopt programs to control various sources of coastal non-point pollution. Section 6217 of CZRA includes recommendations on best management practices for marinas and boaters, which will be evaluated as part of the effort to design an effective pollution prevention campaign for Tampa Bay.

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STRATEGY:

- STEP 1** Work with local port authorities and FDEP to promote P2 waste stream assessments to port tenants and users. Participants would receive a free on-site assessment followed by a report identifying pollution prevention and cost-saving strategies.

Responsible parties: FDEP P2 Program, in cooperation with the port authorities and the Tampa Bay NEP

- STEP 2** Encourage marinas to request a P2 environmental audit to identify pollution sources and appropriate best management practices. Target the bay's 10 largest marinas for participation and audits by October 1997.

Identify major marinas and yacht clubs in the Tampa Bay area and promote the program through direct mail, telephone follow-up and presentations to marina associations. Seek endorsements and co-promotion through these membership associations and from the Center for Marine Conservation and the Clean Water Trust program of BOAT US.

Responsible parties: FDEP P2 Program, with assistance from local Florida Sea Grant Extension Program, Tampa Bay Watch

- STEP 3** Review model programs that promote environmentally responsible marina and boat maintenance practices — including FDEP's emerging Clean Marina Program — for implementation in the Tampa Bay region. Provide recommendations to the Management Conference of the Tampa Bay NEP by October 1997. Pursue public-private partnerships to maximize promotion and cost-share opportunities.

Responsible parties: Tampa Bay NEP, FDEP, Center for Marine Conservation, Tampa BayWatch, user groups

- STEP 4** Aggressively promote P2 to the business community and local governments who can also boost local business participation. As part of this effort, evaluate P2's existing marketing plan and business utilization for ways to improve its coverage. Provide recommendations to FDEP by October 1997.

Responsible parties: Tampa Bay NEP, in cooperation with FDEP and local governments

SCHEDULE:

The NEP, Tampa Port Authority and FDEP targeted Tampa port tenants and users in 1996 through a direct mail solicitation. Other ports and marinas will be targeted in 1997. Steps 3 and 4 also will be initiated in 1997.

COST:

P2 assessments are provided free to businesses that request them, and frequently result in cost savings to participants by reducing their use of toxic materials and associated disposal costs. Cost-effective educational programs can be developed by tailoring existing model programs from other regions, and by aggressively pursuing funding partnerships. Financing may be pursued from local governments, educational grants or the West Coast Inland Navigational District.

ACTION PLAN

Water & Sediment Quality

EXPECTED BENEFITS:

Waste stream assessments and implementation of best management practices at ports and marinas will reduce pollution to the bay.

MONITORING ENVIRONMENTAL RESPONSE:

Sediment quality monitoring by local governments, and waste stream reports that identify reductions, can assess progress in reducing toxic contamination.

REGULATORY NEEDS:

None anticipated.

RELATED ACTIONS:

TX-1, TX-2, PH-3

CHARTING
the **COURSE**
FOR TAMPA BAY

TX-3

Promote Integrated Pest Management on Farms to Reduce Pesticides in Runoff

ACTION:

Encourage the use of Integrated Pest Management (IPM) techniques on farms to reduce pesticide residues in the bay from agricultural runoff.

BACKGROUND:

Agriculture is an important component of the bay region's economy, with an estimated value of \$1.3 billion a year. About one-third of all the land in the bay watershed is used for some form of agriculture. Pasture and range lands comprise the majority of that acreage, followed by citrus groves and row crops.

Because Florida's wet, humid climate promotes the growth of weeds, molds and insects that can damage crops, use of pesticides, herbicides and fungicides is greater in Florida than in any other state. These chemicals tend to adhere to fine soil particles that may be carried in runoff to streams, lakes and bays, where they can be assimilated by aquatic animals through the food web, impairing reproduction or growth.

A recent comprehensive study conducted by the National Oceanic and Atmospheric Administration (NOAA) assessed the levels and effects of pesticides in bay sediments. While concentrations of most substances were below levels expected to cause biological harm, the Tampa Bay NEP has identified several pesticides of concern to Tampa Bay: chlordane, dieldrin, DDT, endosulfan, endrin, heptachlor epoxide, lindane and mirex. Of these, only endosulfan is still actively used by farmers in the Tampa Bay watershed, to control whiteflies and other insects on tomatoes. The remainder are banned or severely restricted.

IPM, a program utilizing biological and chemical weapons to efficiently control pests, is a proven method of reducing use of toxic chemicals and minimizing their release to the environment. IPM techniques include examination of crops to identify pest infestations; use of least toxic control materials such as soaps or oils; use of pheromones to disrupt insect reproductive cycles; and release of pest predators such as ladybugs. Many farmers employ "scouts," full-time or contract employees trained to identify and assess the severity of pest problems and recommend solutions based on IPM principles.

Because no requirements currently exist for IPM use, it is not known how many farmers employ IPM practices, although local extension agents report that most farmers use at least some aspects in their pest management programs. Surveys now being conducted by the University of Florida's Institute of Food and Agricultural Sciences (IFAS) will clarify the extent of IPM usage.

Local agricultural extension agents provide educational materials and assistance to farmers who wish to learn about IPM. They incorporate IPM concepts in training seminars that farm operators attend to earn Continuing Education Credits, which can be applied toward the renewal of their pesticide applicator's license. Additionally, IFAS

scientists have prepared brochures describing pesticides least likely to pollute ground or surface water, based on soil types and leaching potential. These “grower’s guides” offer a range of pesticide options for 54 different crops grown in Florida.

However, many farmers are not aware or do not take advantage of these resources. Compounding this problem is the rise in growth of “corporate farming,” in which packing houses own or lease the land and contract with growers to produce the crops. One effect of this has been to shift some of the decision-making from the growers to the packing houses. Hence, packing house managers, as well as growers, may need to be targeted by IPM educational programs.

Because most farm operators obtain pesticide application licenses from the state Department of Agriculture and Consumer Services (FDACS), tying IPM education to the licenses would ensure that farmers are exposed to IPM concepts. The licenses must be renewed every five years, and a farmer can meet the renewal requirements either by passing an exam or taking courses equal to eight Continuing Education Units (CEUs). Requiring that one section of the exam pertain specifically to IPM practices, or that at least one CEU credit be devoted to IPM training, would offer farmers an incentive to learn more about IPM concepts.

The FDACS is coordinating a cooperative task force, composed of experts from the agricultural and scientific sectors, to encourage the proper or limited application of potential harmful pesticides near waterways. Representatives of various chemical companies also serve on this group, which has concentrated its efforts to date in South Florida. This action calls for the Tampa Bay NEP to participate in this effort by sponsoring a meeting of the U.S. Environmental Protection Agency (EPA) task force in the bay region to share information with local farmers and scientists and obtain recommendations on restricting or reducing the use of certain pesticides.

STRATEGY:

STEP 1 Revise the state pesticide applicator licensing renewal criteria to incorporate in the renewal exam a specific section on IPM. For applicants who choose to earn CEU credits instead of taking the exam, at least one of the credits should encompass IPM training.

Responsible parties: *FDACS, IFAS, State Pesticide Coordinator*

STEP 2 Seek increased federal support from the federal government to implement existing IPM educational and application programs.

Responsible parties: *Tampa Bay NEP, Agency on Bay Management*

STEP 3 Hold a one-day workshop of the pesticide task force in the bay region and encourage participation by local growers, scientists and environmental managers. The workshop should explore:

- the extent and associated environmental effects of pesticides
- specific recommendations to reduce or restrict the use of those that

The logo for TX-4, featuring the letters "TX-4" in a bold, sans-serif font. To the left of the text is a small, stylized graphic of a flower or starburst.

ACTION PLAN

Water & Sediment Quality

present a risk to the bay and bay wildlife

Responsible parties: Tampa Bay NEP, FDACS, EPA

STEP 4 Implement the recommendations of the task force (Step 3), preferably through voluntary cooperation by manufacturers and area farmers.

SCHEDULE:

Step 1 could be initiated in 1997 or at the next review of the pesticide license renewal criteria, with the development of new guidelines focusing on knowledge of IPM. Steps 2 and 3 can be initiated in 1997. Recommendations could be implemented in 1998.

COST:

The costs of revising pesticide license renewal criteria need to be determined. Steps 2, 3 and 4 can be accomplished with existing resources.

EXPECTED BENEFITS:

Reduced use of pesticides by area farmers will reduce the risks to birds, fish and other aquatic life in Tampa Bay.

MONITORING ENVIRONMENTAL RESPONSE:

Annual measurements of pesticide concentrations in sediments will be conducted by local governments as part of the benthic monitoring program for Tampa Bay.

REGULATORY NEEDS:

Revisions to the pesticide applicator licensing renewal criteria developed by the Florida Department of Agriculture and Consumer Services.

RELATED ACTIONS:

SW-8, SW-9

PUBLIC HEALTH

PH

Despite recent strides toward bay recovery, many residents still regard the bay as too polluted to swim in, and its fish and shellfish too contaminated to eat. This lingering, and largely incorrect, perception stems from the 1970s, when the piping of raw or partially treated sewage into the bay resulted in algae blooms that decomposed, producing noxious odors, and bacterial contamination made some segments unsafe even for swimming.

Today, state laws require sewage treatment of the highest level, and the bay is beginning to regain its status as a premier recreational resource. However, substantial emergency discharges of raw or partially treated sewage still occur when heavy rains cause stormwater to seep into some municipal sewer systems, and bacterial contamination still results in the occasional closure of bay beaches to swimming and shellfish beds to recreational harvest. Correcting these problems would be a significant step toward maximizing recreational enjoyment of the bay and allaying public fears about its safety.

Both swimming and shellfish harvesting are restricted when heavy rains wash stormwater, with its high bacteria content, into areas where those activities are permitted and monitored. However, decisions about when to close public beaches are usually based on the threat of contamination, and not on actual sampling that detects high levels of coliform bacteria.

Local health agencies around the bay use different criteria to determine when a beach should be closed. No common water quality standards exist for the bay's saltwater beaches — a shortfall that this action plan addresses.

Knowing that the bay's beaches are monitored routinely and comprehensively, and that decisions about closures or restrictions are based upon current scientific evidence of contamination — not merely the potential of pollution based on past problems — is critical to restoring positive public attitudes about the bay and fostering appreciation of its wide-ranging recreational opportunities.

Additionally, public health concerns can be reduced by corrective actions aimed at eliminating accidental or intentional discharges of sewage to the bay during severe storm events. Sewage overflows are of particular concern in St. Petersburg and Pinellas County, where low land elevations, aging collection systems and rapid population growth strain existing municipal sewer systems. As a result of recent emergency discharges of sewage into waterways during heavy rains, St. Petersburg is now under a consent order issued by the Florida Department of Environmental Protection (FDEP) and is working to remedy problems in its collection system. It will be important in future years for all communities to properly manage and maintain their sewer systems to ensure that the substantial water quality gains achieved by improved treatment facilities are not offset by inadequate collection and distribution networks.

ACTION PLAN

Water & Sediment Quality

SUMMARY OF ACTIONS TO ADDRESS PUBLIC HEALTH

- PH-1 Reduce the occurrence of municipal sewer overflows to the bay.
- PH-2 Establish water quality standards for saltwater beaches.
- PH-3 Install additional sewage pump-out facilities for recreational boaters and live-aboard vessels.

Reduce the Occurrence of Municipal Sewer Overflows to the Bay

PH-1

ACTION:

Require local governments to prepare maintenance plans identifying overflow areas within their sewage collection systems, and address those areas in their maintenance program.

BACKGROUND:

Unintentional sewer overflows are a growing problem nationwide, as sewage transport and collection systems age and increasing population growth taxes the capacity of these networks to accommodate increased flows. In the Tampa Bay region, the problem is compounded by low land elevations, high groundwater tables and heavy rains, which can result in vast amounts of stormwater infiltrating sanitary sewer systems, prompting emergency bypasses of treatment plants and direct discharge of raw or partially treated sewage to Tampa Bay.

In August 1995, excessive rains overloaded sanitary sewers in St. Petersburg, causing sewage backups in homes and forcing officials to shunt about 15 million gallons of raw sewage into canals and creeks leading to Tampa Bay. Further investigation revealed that the city had experienced several overflows in the past. St. Petersburg utility officials commissioned intensive studies to determine the extent of the problem and appropriate corrective actions, and the Florida Department of Environmental Protection (FDEP) subsequently initiated an enforcement action against the city. Similar overflow problems have occurred in Pinellas and Hillsborough counties, and environmental officials expect continued problems as existing collection and transport systems age or become inadequate for increased flows due to growth.

St. Petersburg's experience has highlighted the extent of the problem in the bay area, and helped to identify areas in which improvements are needed to ensure adequate notification, investigation and correction of these problems. For instance, current wastewater regulations only address the operation and maintenance of wastewater treatment plants, with no review of collection systems. Although utilities are required to report unpermitted emergency discharges to the FDEP within 24 hours, there is often no way to know what problems exist until an overflow has occurred. Then the utility is often placed in an enforcement mode, and reviewed on a case-by-case basis. Additionally, utilities are often blamed for overflows in systems owned by their wholesale customers — usually smaller communities with no treatment plants of their own — since the wastewater permit is issued to the utility owning and operating the treatment plant.

Recognizing the serious threats posed to water quality and human health by unintentional overflows, the U.S. Environmental Protection Agency (EPA) Region IV office in Atlanta convened an internal working group in early 1996 to discuss ways to improve compliance and enforcement strategies. Among the products being developed

PH-2

ACTION PLAN

Water & Sediment Quality

**Establish Water Quality Standards
for Saltwater Beaches**

ACTION:

Develop local water quality standards for beaches and encourage all counties and cities in the Tampa Bay region to use those standards for monitoring public beaches.

BACKGROUND:

Beach closures resulting from fecal coliform in the water have been a problem in some parts of the bay where swimming is permitted, such as Spa Beach in St. Petersburg and Picnic Island Park in Tampa. The closures are usually a result of poor water quality, as evidenced by the presence of fecal coliform, usually found in small areas in high concentrations after heavy rainstorms.

Sampling of area beaches is typically conducted monthly by local public health units. However, there are no uniform standards for restricting swimming and other water-contact recreation, such as windsurfing, in saline waters. Consequently, bay area communities have applied different standards to determine whether beaches should be temporarily closed, possibly analyzing different parameters and using different sampling techniques. Additionally, new research indicates that fecal coliform may not be an accurate indicator of potential public health problems, since it does not detect viruses or other pathogens that may be present. When more accurate analytical indicators have been fully developed, local governments may want to consider using those as a substitute or in combination with testing for fecal coliform. Consistent standards throughout the region would improve public health protection and maximize recreational use of the bay while helping to identify sources of water quality problems at bay beaches.

STRATEGY:

- Step 1 Review existing standards, parameters and sampling techniques used by local governments and public health units for testing of beach waters. A summary of these standards has been completed as part of a technical study for the Tampa Bay NEP.

Responsible Parties: the state Department of Health and Rehabilitative Services (HRS) is responsible for establishing water quality parameters for public health purposes and should lead this effort, with local coordination provided by the Tampa Bay Regional Planning Council. Local health units and environmental agencies also should participate.

- Step 2 Establish uniform standards, sampling techniques and monitoring schedules for waters near public beaches. The standards should be parameters commonly monitored for public health concerns and should be formally adopt-

ed by each government in the form of a local regulation.

Responsible Parties: *HRS, local government health units and environmental management departments*

SCHEDULE:

Step 1 can begin in 1997, with standards available for adoption in 1998.

COST:

Only staff time, document preparation and administrative costs are anticipated if fecal coliform is retained as the primary analytical indicator. If new indicators are recommended, additional sampling and testing costs will have to be determined.

EXPECTED BENEFITS:

Increased public health protection and increased knowledge about the status and problems of bay waters.

MONITORING ENVIRONMENTAL RESPONSE:

Using a uniform set of standards and sampling techniques to test beach waters will increase the effectiveness of bay monitoring programs. Sampling can be done more frequently and results can be compared to other portions of the bay, so trends in water quality can be determined and problem areas more readily identified.

REGULATORY NEEDS:

Amendments to local or state regulations will be needed to adopt a uniform standard for marine water quality monitoring.

RELATED ACTIONS:

PH-1, PH-3

PH-2

PH-3

Install Additional Sewage Pump-out Facilities for Recreational Boaters and Live-aboard Vessels

ACTION:

Assist local governments in obtaining assistance through the Florida Clean Vessel Act grant program to construct sewage pump-out facilities at publicly owned marinas bordering Tampa Bay.

BACKGROUND:

In the past, efforts to reduce sewage discharges in Tampa Bay justifiably have focused on improvements to land-based wastewater treatment plants serving one or more municipalities. But with these facilities now operating under strict pollution prevention rules, attention should be shifted to the smaller, yet continual discharges of the thousands of boaters who routinely ply the bay.

There are 214 marinas in the three counties surrounding the bay. Of the 25 that have pump-out facilities, 19 are in Pinellas County, and three each are in Hillsborough and Manatee. Of the two public marinas in the region with pump-out stations, only one, in downtown St. Petersburg, is located directly on the bay. Providing more pump-out facilities would help reduce fecal coliform as well as nitrogen loadings and suspended solids associated with sewage while encouraging boaters to become more responsible stewards of the bay they enjoy.

Pathogens associated with human wastes can severely impact a body of water, leading to restrictions on bathing, swimming and shellfish harvesting. Although the exact effect of sewage discharges from boats on Tampa Bay is not known, studies in other waterways indicate the untreated human wastes of a single boater can be equal to the treated wastes of thousands of people. More than 100,000 boats are registered in the three-county area surrounding Tampa Bay, and many more transient boaters pass through. In addition, an unknown number of live-aboards reside at bay area marinas.

Guidelines proposed by the U.S. Clean Vessel Act call for one pump-out station for every 300- 600 boats. Following those recommendations, Hillsborough County should have 18 pump-outs, Pinellas 25, and Manatee 7. Additionally, a new state law, effective October 1994, prohibits boaters from dumping raw sewage into Florida waters and requires many boats 26 feet or longer to have a working toilet with waste storage on board when in state waters. To aid compliance, the state is offering grants for the next five years to assist marinas in adding or improving pump-out facilities. The grants, administered by the Florida Office of Waterway Management, will cover 75 percent of the project's cost, and can be used for public education and for planning, permitting, purchasing and installation of pump-out equipment and portable toilet dump stations. Marinas awarded funds may charge boaters up to \$5 for a pump-out. If economically feasible, the pumpout stations should be connected to municipal sewer systems, rather than septic tanks or package plants. Another option would be to implement a portable collection system, called a "honey barge," that travels to boaters on the water and performs pump-outs.

To further encourage responsible stewardship, the Florida Department of Environmental Protection (FDEP) is developing a Clean Marina Program to encourage marinas to adopt best management practices (BMPs) — emphasizing that what is good for the environment also is good for business.

PH-3**STRATEGY**

- Step 1 Identify public marinas on the bay used by a large volume of boaters, particularly within the city of Tampa. The U.S. Coast Guard or community boating groups may be able to assist in identifying the most frequently used marinas.

Responsible parties: *City of Tampa and other municipalities, Florida Marine Patrol, Agency on Bay Management (ABM)*

- Step 2 Based on the results of Step 1, encourage the responsible municipality to apply for a state grant to construct sewage pump-out stations at marinas.

Responsible parties: *local governmental environmental management departments, ABM, Tampa Bay National Estuary Program*

- Step 3 Construct a sewage pump-out facility or explore portable methods of sewage collection at marinas awarded grants. Provide educational materials to boaters on-site explaining the importance of the facility or portable system and how to use it. Disseminate educational materials to boating clubs in the region making them aware of the facility.

Responsible parties: *local governments, local boating clubs*

- Step 4 Encourage participation in FDEP's BMP program for marinas. Consider implementing the program at a publicly owned marina to serve as an example for commercial marinas.

Responsible Parties: *local governments, ABM, Tampa Bay NEP*

SCHEDULE:

Steps 1 and 2 were initiated in 1996. Step 3's schedule is dependent upon awarding of grant, but construction could begin in 1997. Step 4 also can be initiated in 1997.

COST:

Installation and construction costs vary depending on type of equipment selected. Costs for a stationary or portable pump-out unit range from approximately \$2,000-\$6,000. Costs for a portable toilet waste station vary from \$1,100-\$1,800. With a state grant paying 75 percent of the construction costs, the project's costs to a municipality would be substantially reduced. In addition, construction and maintenance costs could be recouped by charging boaters a minimal user fee.

EXPECTED BENEFITS:

Providing sewage pump-out services for boaters will help reduce pathogens as well as nitrogen and solids in Tampa Bay.

ACTION PLAN

Water & Sediment Quality

MONITORING ENVIRONMENTAL RESPONSE:

Use of the pump-out stations can be tracked to determine effectiveness. Boaters at the participating facility also can be surveyed to ascertain if they are using the pump-out service and how it can be improved.

REGULATORY NEEDS:

None anticipated, with the exception of permits required for installation.

RELATED ACTIONS:

PH-1, PH-2, WW-2